



Supervised Physical Therapy Versus Video-Assisted Technique for Chronic Mechanical Low Back Pain: A Comparative Study

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Abstract

Objective To compare the effect of supervised physical therapy versus video-assisted technique in patients with chronic mechanical low back pain.

Materials and Methods This is a comparative study. Forty-two patients were recruited in the study where they were randomized by simple random sampling. Group A ($n = 21$) received supervised physical therapy, and Group B ($n = 21$) received the video-assisted technique. The intervention was given 45 minutes per day for 15 days. The measures of visual analog scale (VAS) and Roland–Morris Disability Questionnaire (RMQ) were taken both at baseline and after 15 days of intervention.

Results Comparison between the two groups using Mann–Whitney U test, supervised physiotherapy group showed significant improvement in VAS on activity, RMQ, and RMQ percentage ($p < 0.005$). However, Group A, VAS on rest was not significant ($p > 0.005$).

Conclusion Supervised physical therapy is effective in reducing pain on activity and improved the disability of patients with chronic mechanical low back pain than the video-assisted technique.

Keywords

- ▶ mechanical low back pain
- ▶ supervised physical therapy
- ▶ home exercise
- ▶ video-assisted technique

Introduction

Mechanical back pain is the most prevalent type of back pain in musculoskeletal disorders.¹ According to epidemiological research, over 95% of the world's population suffers from mechanical low back discomfort.² Mechanical low back pain (MLBP) costs industrialized countries a lot of money on a global scale. It has one of the most expensive treatments, resulting in considerable direct medical expenses as well as indirect social costs such as lost productivity, disability, and workers' compensation claims.^{3,4} MLBP is recognized by the presence or absence of signs and symptoms with work-related issues, different postural defects, and its move-

ments.^{5,6} Supervised physical therapy is where the physical therapist is physically present on the premises and immediately available for direction and supervision. Supervised physical therapy needs certain available resources, time, and cost, which may sometimes not be affordable with the patients or applied in clinical settings.⁷

Unsupervised training or video-assisted training comes as an attractive, low-cost alternative for supervised physical therapy that a patient can perform by looking at videos that consist of exercises related to the condition.⁸

Studies have shown that supervised physical therapy is better than unsupervised physical therapy.⁹ Patients suffering from low back pain as a result of the COVID-19 pandemic

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or due to other reasons are unable to attend hospital therapy, demanding the use of a video-assisted technique. As a result, the study's goal is to determine if video-assisted techniques are beneficial when compared with supervised techniques.

Materials and Methods

Trial Setting

A comparative study was conducted from April 2020 to April 2021 at Justice K. S. Hedge Charitable Hospital, Mangalore, Karnataka. The ethical clearance for the proposed study was acquired from Nitte Institute of Physiotherapy's Institutional Ethics Committee, Mangalore, Karnataka, India on March 3, 2020, with reference no NIPT/IEC/Min/20/2019–2020. The study was registered under the CTRI number CTRI/2020/11/029126. This trial followed the ethics of research in humans (Helsinki convention norms) and the participants were informed about the process of study and consent was obtained. The participants were also made known about their rights to withdraw anytime their participation from the study. Materials that were used for research included the screening tool, data collection sheets, informed consent forms, pocket diary, paper, pen, smartphones, and mat.

The participants were randomly allocated to two groups. Group A received thermotherapy, hamstring, and back muscles stretching and core stability exercises were given as a part of the conventional treatment under the supervision of a physical therapist, whereas Group B received the same as above but in the form of a video. VAS was used for pain and disability was measured by RMQ.

Group A

The treatment was delivered to the subjects under the supervision of a physical therapist. Outcome measures VAS and RMQ were taken before starting the treatment and after 2 weeks.

Patient education and ergonomic advices were given in the beginning of study. Moist heat application was given for 10 minutes, Hamstring and back muscles stretching-patient was asked to sit in a long sitting position with knees fully extended and feet together free or plantar flexion. Then, the patient was asked to bend forward from the hip to reach toward the feet with the head in flexion, hold for 30 seconds, repeat for 3 sets of 10 repetitions, and rest time for 30 seconds.

Core stability exercises: Abdominal tuck-in: The patient was asked to be in a crook lying position with the arms beside the body. Pull the umbilicus toward the spine and hold for 10 seconds (3 sets), 10 repetitions. Straight leg raise: The patient should be lying in the supine position with arms beside the body and was asked to lift one leg for ~15 cm off the floor and hold for 10 seconds and return to the position. Repeat the exercise on the other side as well. Three sets (10 repetitions). Bridging: The patient was asked to lie in the supine crook position with arms beside and was asked to raise the hip and contract the abdomen, keeping feet flat on the floor and hold for 10 seconds and return to the same position and relax the abdomen (3 sets, 10 repetitions). Plank: The patient was asked to get in a push-up position and with forearms on the ground instead of hands, the

patient was asked to tighten the abdominals keeping the neck and spine in a neutral position by creating a straight line from the head to toe, hold for 5 to 10 seconds, 10 repetitions, 3 sets. Bird dog exercise: The patient was asked to get into the quadruped position and asked to pull the abdomen into the spine, keeping the back and pelvis still and stable. The patient was asked to raise one arm and opposite leg and hold for 5 to 10 seconds and return to the starting position and repeat with the other side (10 repetitions, 3 sets).

Group B

Patients received the same exercises as Group A but in the video form; VAS and RMQ were taken before the study and after 2 weeks. Here, the patient was called for follow-up and again all outcome measures were taken to evaluate the results. Patients were given a pocket diary and a pen to note down the date and time whenever they performed exercise.

Results

Data analysis was performed by SPSS (version 17) for Windows. Alpha value was set as 0.05. Descriptive statistics were performed to calculate the mean and standard deviation for demographic variables and outcome variables. Unpaired *t*-test was used to compare demographic variables, such as age. A Chi-square test was used to compare the gender distribution between the groups. Mann-Whitney *U* test was used to identify differences in scores between the groups for VAS on rest, VAS on activity, RMQ, and RMQ percentage. Wilcoxon signed rank-sum test was used to identify significant differences within groups for VAS on rest, VAS on activity, and RMQ. Microsoft Excel and Word were used to generate graphs and tables. Demographic baseline data are mean \pm standard deviation (SD). In Group A, the mean and SD of age was 37 ± 12.16 and in Group B, the mean and SD of age was 28.86 ± 9.68 . In Group A, there were 10 males and 11 females and in Group B, there were 6 males and 15 females. Both age and gender were homogenous among both groups. When compared between groups, the mean VAS on rest post score in Group A was 3.00 with a standard deviation of 1.09 and the mean VAS on rest post score in Group B was 3.05 with a standard deviation of 1.20, which was not statistically significant ($p > 0.861$; Mann-Whitney *U* value was -0.61632). The mean VAS on activity post score in Group A was 4.00 with a standard deviation of 1.304 and the mean VAS on activity post score in Group B was 4.90 with a standard deviation of 0.889, which was statistically significant ($p < 0.022$; Mann-Whitney *U* value was -2.12566). The mean RMQ post score in Group A was 5.62 with a standard deviation of 1.80 and the mean RMQ post score in Group B was 7.43 with a standard deviation of 1.75, which was statistically significant ($p < 0.003$; Mann-Whitney *U* value was -2.89291) within the group was analyzed using the Wilcoxon test.

Discussion

The current study was designed to evaluate the effect of supervised physical therapy over video-assisted technique on patients with chronic MLBP.

The researcher took 1 year to complete the study. In total, 108 subjects were screened for the study; 47 participants had difficulty in traveling to and from the hospital, 28 participants did not respond, 7 participants did not use smartphones, and 26 participants had other reasons. The screening tool included the demographic data, history of back pain, pain assessment VAS and RMQ for both pain and disability. In total, 42 patients were included in the study, 21 in each group, Group A (supervised physical therapy) and Group B (video-assisted technique) for 15 days. The outcome measures VAS and RMQ were taken on the first day and 15th day. A comparison between the groups showed that VAS on activity, RMQ, and RMQ percentage were having significant ($p < 0.05$), whereas VAS on rest was not having significant differences ($p > 0.05$).

The present study revealed a significant decrease in the RMQ percentage and RMQ score in Group A (supervised physical therapy) when compared with Group B (video-assisted technique). The results have been supported by Matarán-Peñarrocha et al⁹ and Will et al,¹⁰ on supervised physical therapy and unsupervised physical therapy on chronic MLBP where patients with persistent low back pain who got supervised exercise improved more in all patient-rated outcomes in short- and long-term than those who did not.

This study showed that supervised physical therapy resulted in better improvement than video-assisted technique ($p < 0.05$). The same was reported by Shahzad et al¹¹ and Coulombe et al¹² whose study was conducted on weight lifters injuries by dividing them into two groups where one was under the supervision and the other was one under non-supervised; the results showed a significant improvement in supervised physical therapy by evaluating the Nordic musculoskeletal questionnaire, which revealed less injury under supervision. Hence, the present study showed significant result as in the Coulombe et al study.¹²

Unsupervised or video-assisted physical therapy is less beneficial than supervised physical therapy because the physical therapist will supervise and motivate the patient to perform the exercise with appropriate guidance and help the patient to perform the exercise on a regular basis, whereas in unsupervised or video-assisted physical therapy, the patient may lack motivation and may not continue the exercise.

Conclusion

The present study demonstrates that both supervised physical therapy and a video-assisted technique help alleviate pain and disability in chronic MLBP. However, comparing both groups, supervised physical therapy has better improvement than video-assisted technique in chronic MLBP. In supervised physical therapy, the physical therapist will supervise and

motivate the patient to perform the exercise with appropriate guidance and help the patient to perform the exercise on a regular basis. However, due to personal circumstances, such as a pandemic, due to which a few patients complained about not being able to make it to the hospital on time and other personal reasons; so at this time, the visual-assisted technique could be useful.

Conflict of Interest

None declared.

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